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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,140	01/29/2002	Takafumi Taguchi	1403-0223P	7690
2292	7590	03/24/2004	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			KNABLE, GEOFFREY L	
			ART UNIT	PAPER NUMBER
			1733	
DATE MAILED: 03/24/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/058,140	<b>Applicant(s)</b> TAGUCHI ET AL.	
	<b>Examiner</b> Geoffrey L. Knable	<b>Art Unit</b> 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 July 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 07/486,604.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1-29-2002</u> | 6) <input type="checkbox"/> Other: _____  |

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1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch et al. (US 3,038,515) taken with the excerpted Exxon technical article, Gessler et al. (US 4,014,852) and (optionally) GB 2,072,576 to Exxon (Hous et al.).

These references are applied for substantially the same reasons set forth by the Board of Appeals in their November 29, 2001 affirmance of the examiner's rejection in parent application 08/110,836. The comments made therein by the Board of Appeals are incorporated herein by reference (if possible, to complete the record in this (electronic) file, it would be helpful if applicant could provide a copy of the Board of Appeals decision from the parent application 08/110,836 with any subsequent

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response). Further, for convenience and for the record, the examiner's statement of rejection made in the Examiner's Answer in 08/110,836 is reproduced below:

"Koch et al. '515 discloses a pneumatic tire including a carcass (2) turned up around the beads (3/4) and an inner liner (7) of "butyl type" rubber bonded to the carcass through a GRS based (i.e. SBR, a well known diene rubber) intermediate rubber layer (8) - note fig. 1 and col. 4, lines 12+. Exemplary amounts of sulfur of 3 parts for the intermediate layer, along with a suggestion that increased sulfur is desirable in this context (col. 3, lines 45-51), as well as the use of an "accelerator," are also suggested (note the table entitled "Example I"). Although the type of accelerator is not mentioned, the reference suggests that "[t]hose skilled in the art will be able to select compounding pigments such as vulcanization agents...to arrive at desired physical properties for the vulcanized compounds of the invention" (col. 4, lines 49-53). This reference thus teaches a tire meeting each of the claim 1 requirements except that a butyl/halobutyl blend in the liner is not suggested and a sulfenamide accelerator is not explicitly described. The sulfur content is also not related in the manner claimed.

Pages 53-54 of the cited Exxon technical article indicate that halobutyl can be blended with regular butyl at amounts of up to 30% to provide a "significant increase in flex resistance" and also a small benefit in retained elongation after heat aging while leaving permeability, tack and processing characteristics unchanged (note further that this would have been read to clearly contemplate applications as an innerliner material as mention is made of adhesion to a "tyre carcass compound"). It would therefore have been prima facie obvious to replace the all halobutyl compound of Koch et al. with a halobutyl/regular butyl blend as taught by the Exxon article with the expectation of improved flex resistance, etc. in the resultant compound. It should be stressed that the expectation of improved flex resistance is considered to have provided an expectation of improved crack growth resistance, it being considered that damage from excessive flex would be expected to manifest itself in a rubber composition as a crack in the material. Note that both "flex resistance" as set forth in the Exxon technical article (note esp. Table 1 on page 54), and cut growth resistance as defined in the present specification, are measured by subjecting the material to repeated fatigue or flexing. Thus, enhanced flex resistance in essence is considered to lead to a reasonable expectation of enhanced cut growth resistance.

As to the amount of sulfur, the exemplary amount of sulfur taught by Koch et al. (i.e. 3 parts as already mentioned) will overlap that claimed for amounts of butyl within the range taught by the Exxon technical article. Further, and in any event, it is well within the skill level of the ordinary artisan to select an appropriate amount of sulfur to achieve desired end product properties and in particular an appropriate vulcanization - e.g. note col. 4, lines 49-53 of Koch et al. Note also that the problem that the Koch et al. reference is addressing is the poor adhesion of butyl type liners to GRS (i.e. SBR) carcass plies because the GRS polymers have much greater unsaturation than the butyl rubber liner and thus they "hog" the sulfur and thereby prevent satisfactory vulcanization of the butyl layer (note col. 1, lines 17-25 of Koch et al.). The intermediate layer is thus

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included to in part avoid this "hogging" of the sulfur from the butyl layer. Koch et al. indicates additional considerations in selecting the amount of sulfur for the intermediate layer and in particular, those that would suggest slightly larger amounts of sulfur (note col. 3, lines 45-55). It would thus be clear to the ordinary artisan that the amount of sulfur in the intermediate layer should be such that appropriate vulcanization and bonding are present and thus this parameter is considered to have been a result effective variable that would have been readily optimized by the ordinary artisan through routine experimentation. It should be noted that the intermediate rubber layer as claimed includes essentially an increased amount of sulfur over what normally would be present for such a layer (see page 6, lines 26-29 of the present specification) - this however is entirely consistent and obvious from what is suggested by the cited prior art - relatively higher sulfur is necessary to help account or provide a buffer for the hogging of the sulfur by the unsaturated carcass layers.

As to the use of a "sulfenamide accelerator", note that the Koch et al. reference suggests using an accelerator of unspecified type ("Example I" table) but then suggests that "[t]hose skilled in the art will be able to select compounding pigments such as vulcanization agents...to arrive at desired physical properties for the vulcanized compounds of the invention" (col. 4, lines 49-53). Sulfenamide accelerators are also extremely well known and commonly used in rubber cure systems. Further, the Exxon article indicates on page 53 that when bromobutyl is blended with regular butyl, the vulcanization chemistry is significantly altered and therefore "one should avoid accelerator systems that will rapidly over-cure the halobutyl phase." Also, the exemplary cure accelerators include "sulfenamides" (e.g. Santocure), which are apparently known to be "less potent" accelerators (note Gessler et al. at col. 5, lines 49-57 - it should additionally be pointed out that Gessler is also directed to curing butyl/halobutyl blends). In light of this understanding, the avoidance of the more potent accelerators in the bonding layer when using blends of halobutyl/regular butyl would have been obvious to the ordinary artisan to avoid problems with improper cure of the blend. While it is recognized that the present claims are in reference to the accelerator in the intermediate layer, it is not unobvious to also avoid the potent accelerators in this layer because of the well known fact that such materials migrate between layers. As one clear example of this, note col. 1, lines 17-25 of Koch et al. clearly show that migration of vulcanization agents is known and leads to adhesion problems. Thus, much as the migrating vulcanizing agents deleteriously affect the adhesion as described by Koch et al., migration of the more potent accelerators would have been expected to deleteriously affect the bond between the butyl blend layer and the adjacent rubber layer because of their known deleterious effects on the cure of such blends (as suggested in the Exxon article). In summary, it is submitted that sufficient evidence has been presented to expect that the ordinary artisan is sufficiently skilled in the art of rubber vulcanization to select appropriate levels (and types) of vulcanization agents (sulfur, accelerator, etc) to achieve satisfactory vulcanization of a tire with a liner and rubber layer as claimed.

GB '576 to Exxon has been optionally applied as an additional teaching that a generally recognized problem in tires is the adhesion between the unsaturated rubber

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used in the tire carcass and halobutyl used in the innerliner. This reference further evidences it to be conventional to include an additional bonding layer to help solve this problem.

As to claim 2, the ordinary artisan would have readily appreciated that the thickness ranges presented therein represent extremely wide ranges that would have represented obvious selections. For example, requiring that C/B be less than 1 simply defines nothing more than that an additional layer is present or even simply that the carcass ply has a skim coat of rubber (as customary) - such is clearly taught by Koch et al. '515. Similarly requiring that C/B be greater than or equal to 0.2 simply defines a minimum thickness for the inner liner ply. Since the main purpose of the inner liner ply, namely air/moisture permeation resistance, is well established and understood in this art, it is certainly not beyond the skill of the artisan to select a certain appropriate minimum liner thickness and the claimed value has not been shown to produce unexpected results. Similarly, the broadly claimed relative liner and tire thicknesses C/D as claimed are considered to cover almost any common and conventional configuration and would present none but the expected results.

As to claim 3, as noted in the first office action, extending the liner edge below the rim flange was taken to be conventional per se in this art and therefore prima facie obvious. Further, the liner in Koch et al. as depicted would seem to end below the rim flange as claimed. As to claim 4, as already noted, Koch et al. suggests GRS which is a styrene-butadiene rubber (i.e. SBR). As to claim 5, note that Koch suggests larger amounts of sulfur in the intermediate layer to make up for the retarding effect of the silica - note also that the amount in "Example I" (i.e. the intermediate layer) is larger than the amount in "Example II" (i.e. the butyl layer). Given the higher unsaturation of the GRS layer, it further would have been expected that higher sulfur would be present for cure of such layers.

Claim 6 differs from claim 1 in requiring carbon black in the intermediate layer. However, most (by far) rubber layers used in tire applications (other than for example white sidewalls) include carbon black reinforcing filler. Note further that Koch et al. '515 clearly teaches the inclusion of carbon black in the intermediate layer - note the table entitled "Example I" in the patent.

As to claim 7, although Koch et al. '515 is primarily directed to GRS (i.e. SBR) intermediate layers, the reference would seem to contemplate the use of other diene rubbers as claimed - note col. 2, lines 26-30. Further, it is submitted that the bonding problems due to the difference in the degree of saturation between the butyl layer and the more highly saturated carcass rubber would have been expected to be present for conventional unsaturated carcass rubbers other than just SBR (i.e. including NR, IR and BR, which are taken to be well known/conventional carcass rubber materials, as claimed). As such, the teaching to include an intermediate layer to help avoid the hogging of the sulfur by the carcass would have been expected to also be applicable to such other carcass rubbers. GB '576 to Exxon supports the statement that tire carcass materials are well known to include NR, BR and IR as well as SBR - note page 1, lines 12-15."

As to the changes made to claims 1 and 6 in the 7-26-2002 amendment, there were two substantive changes made with respect to the claims as they appeared before the Board of Appeals: first, the term "essentially" was removed from the description of the rubber component of the first rubber composition (i.e. the inner liner) and second, the second rubber composition (i.e. of the rubber bonding layer) was newly defined to include "a rubber component consisting of" a diene rubber rather than simply "including a diene rubber".

With respect to the removal of the term "essentially" from the description of the rubber component of the first rubber composition (this being done apparently to better define over Koch et al. by excluding the natural rubber in "Example II" of Koch et al.), it should first be noted that it is not entirely clear that this necessarily can be read as excluding the natural rubber from Koch et al. as arguably there is no clear indication or requirement that this rubber component be the only rubber component in the first rubber composition or in fact that the "first rubber composition" is the only rubber composition in the inner liner (reading "made of" as open). In any event, whether or not the natural rubber is excluded, the Board of Appeals has determined that the prior art "teachings would have reasonably suggested to one of ordinary skill in this art that the blend of natural rubber and chlorobutyl rubber in the compounding composition for the inner liner of Koch Example II can be replaced with a blend of regular butyl and bromo- or chlorobutyl rubber..." (first full paragraph from page 11 of the decision by the Board of Appeals). As such, providing a composition for the inner liner that only includes the regular and halobutyl was determined by the Board of Appeals to have been taught.

With respect to newly defining the second rubber composition (i.e. of the rubber bonding layer) to include "a rubber component consisting of a diene rubber" rather than simply "including a diene rubber", it is not considered that this language excludes the presence of other rubber components consisting of other rubbers, i.e. since the term "including" is an open term (akin to "comprising"), defining that the composition "includes a rubber component consisting of a diene rubber" does not exclude the inclusion of other rubber components consisting of other rubbers. Further, it is not entirely clear that the term "diene" rubber even excludes butyl rubbers since they are copolymers that include isoprene.

Although applicant additionally argues that the claim 6 language excludes the presence of silica in the second rubber composition, the relevant language is unchanged from that before the Board of Appeals and the Board of Appeals has already unambiguously determined that silica is not excluded (e.g. page 14 of the decision by the Board of Appeals).

4. Claims 1-7 are rejected under 35 U.S.C. 103 as being unpatentable over Koch et al. (US 3,038,515) taken with Berta (US 4,616,686) and Berta (US 4,587,302).

These references are applied for substantially the same reasons set forth by the Board of Appeals in their November 29, 2001 affirmance of the examiner's rejection in parent application 08/110,836. The comments made therein by the Board of Appeals are incorporated herein by reference. Further, for convenience and for the record, the examiner's statement of rejection made in the Examiner's Answer in 08/110,836 is reproduced below:



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"Koch et al. '515 discloses a pneumatic tire including a carcass (2) turned up around the beads (3/4) and an inner liner (7) of "butyl type" rubber bonded to the carcass through a GRS based (i.e. SBR, a well known diene rubber) intermediate rubber layer (8) - note fig. 1 and col. 4, lines 12+. Exemplary amounts of sulfur of 3 parts for the intermediate layer, along with a suggestion that increased sulfur is desirable in this context (col. 3, lines 45-51), as well as the use of an "accelerator" are also suggested (note the table entitled "Example I"). Although the type of accelerator is not mentioned, the reference suggests that "[t]hose skilled in the art will be able to select compounding pigments such as vulcanization agents...to arrive at desired physical properties for the vulcanized compounds of the invention" (col. 4, lines 49-53). This reference thus teaches a tire meeting each of the claim 1 requirements except that a butyl/halobutyl blend in the liner is not suggested and a sulfenamide accelerator is not explicitly described. The sulfur content is also not related in the manner claimed.

Berta '686 is directed to advantageous inner liner compositions for tires having good impermeability and physical properties, this composition including mixtures of butyl rubber and halobutyl rubber with at least 50% being halobutyl rubber and, in one embodiment, 75 parts halogenated butyl rubber (i.e. chlorobutyl) and 25 parts butyl (i.e. regular butyl), these falling well within the claimed ranges - note example 15 in Table 1. Sulfenamide accelerators are also mentioned (col. 1, lines 62). To replace the butyl-type liner of Koch et al. '515 with the improved butyl liner composition taught by Berta '686 would have been prima facie obvious in light of the advantageous properties expected to accompany the use of such a liner material as taught specifically at col. 1, lines 13-30 and 44-49 of Berta '686.

As to the amount of sulfur, the exemplary amount of sulfur taught by Koch et al. (i.e. 3 parts as already mentioned) will overlap that claimed for amounts of butyl within the range of Berta '686. Further, and in any event, it is well within the skill level of the ordinary artisan to select an appropriate amount of sulfur to achieve desired end product properties and in particular an appropriate vulcanization - e.g. note col. 4, lines 49-53 of Koch et al. Note also that the problem that the Koch et al. reference is addressing is the poor adhesion of butyl type liners to GRS (i.e. SBR) carcass plies because the GRS polymers have much greater unsaturation than the butyl rubber liner and thus they "hog" the sulfur and thereby prevent satisfactory vulcanization of the butyl layer (note col. 1, lines 17-25 of Koch et al.). The intermediate layer is thus included to in part avoid this "hogging" of the sulfur from the butyl layer. Koch et al. indicates additional considerations in selecting the amount of sulfur for the intermediate layer and in particular, those that would suggest slightly larger amounts of sulfur (note col. 3, lines 45-55). It would thus be clear to the ordinary artisan that the amount of sulfur in the intermediate layer should be such that appropriate vulcanization and bonding are present and thus this parameter is considered to have been a result effective variable that would have been readily optimized by the ordinary artisan through routine experiment. It should be noted that in essence, the intermediate rubber layer as claimed includes an increased amount of sulfur over what normally would be present for such a layer (see page 6, lines 26-29 of the present specification) - this however is entirely consistent and obvious from what is suggested by the cited prior art - relatively

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higher sulfur is necessary to help account for the hogging of the sulfur by the unsaturated carcass layers.

As to the use of a "sulfenamide accelerator", note that the Koch et al. reference suggest using an accelerator of unspecified type ("Example I" table) but then suggests that "[t]hose skilled in the art will be able to select compounding pigments such as vulcanization agents...to arrive at desired physical properties for the vulcanized compounds of the invention" (col. 4, lines 49-53). Sulfenamide accelerators are also well known and commonly used in rubber cure systems - e.g. note Berta '686 (col. 1, line 62). In summary, it is submitted that sufficient evidence has been presented to expect that the ordinary artisan is sufficiently skilled in the art of rubber vulcanization to select an appropriate level (and type) of vulcanization agent (sulfur, accelerator, etc.) to achieve satisfactory vulcanization of a tire with a liner and rubber layer as claimed.

Berta '302 is directed to tire inner liner compositions that may include mixtures of butyl and halobutyl rubber (note claim 1) as well as 1-20% of a chlorinated hydrocarbon polymer. This composition is consistent with that in example 15 in table 1 of Berta '686 and thus provides some evidence of (and context to) the artisan's understanding of the 10 parts of chlorinated polyisoprene included in this composition as well confirmation that the epihalohydrin rubber (mentioned in Berta '686) is not necessary for an inner liner. This reference has thus been applied to support the examiner's position that defining that the liner rubber component "consists essentially of" the butyl blend, either does not exclude the presence of the chlorinated polyisoprene rubber in example 15 of Berta '686 or does not define an unobvious composition over the Berta reference.

In particular, note first that it can be argued that the chlorinated polyisoprene from example 15 is not part of the rubber component of the composition but rather is simply an "additive" - e.g. note that the parts of the butyl and chlorobutyl in example 15 add up to 100 parts. Recognizing the general convention in rubber compounding that the "rubber components" add up to 100 parts ("PHR"), it is submitted that the ordinary artisan would have understood this as suggesting that these two rubber materials alone are or would be sufficient to constitute the "rubber component" in the mixture. The chlorinated hydrocarbon is then nothing more than another additive in the composition, much like carbon black, tackifying resins, oils, etc. Note also col. 4, line 37 refers to chlorinated hydrocarbon as an "additive". Finally, note the chlorinated hydrocarbon is presented in the table not with the rubber components (which add up to 100 parts) but rather with the other "additives". Taken together, it is submitted that the ordinary artisan would have understood this as being an indication that compositions where the rubber component comprises butyl and halobutyl rubbers alone are within the scope of the invention in this reference.

Secondly, recognizing that the phrase "consisting essentially of" only excludes those materials that materially affect the basic and novel characteristics of the composition, it has not been shown that this language excludes the chlorinated polyisoprene additive. In other words, whether or not this "additive" is present, it is submitted that the basic characteristics of the composition are the same - namely a low permeability elastomeric material. Although it has been argued that the "Taguchi I" declaration (filed 2-19-1996) shows that inclusion of an ingredient as in Berta adversely

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affects the product, particularly the cut growth resistance, note that the cut growth resistance in the relevant example "D" from the Taguchi I declaration is well within the range of acceptable values for the inventive compositions when comparison is made with the cut growth values in Table 1 of the specification. A conclusion that this is excluded is thus untenable on this grounds as well.

Finally, note that Berta '686 indicates that the chlorinated polyisoprene additive is within a class of materials named "chlorinated hydrocarbons", and may be used either as chlorinated polyisoprene or chlorinated polyolefin. Berta '302 makes it even clearer that the artisan would have recognized that both chlorinated polyisoprene and chlorinated polyolefin are suitable alternatives, and it therefore would have been well within the skill of the artisan to utilize a "chlorinated polyolefin" in place of the chlorinated polyisoprene in a composition consistent with ex. 15 in Berta '686. In such case, it seems that the sole rubber material present would be the two butyl rubbers. Although appellant has argued that Berta '302 is "merely a cumulative reference", it is submitted that the above noted teachings are critical to a complete understanding of example 15 in Berta '686. It should finally be noted also that Berta '686 is directed principally to an improved curative system, not particular rubber compositions. This cure system thus would seem to have applicability to rubbers including epihalohydrin rubber well as those that do not include this material (ex. 15).

As to claim 2, the ordinary artisan would have readily appreciated that the thickness ranges presented therein represent extremely wide ranges that would have represented obvious selections. For example, requiring that C/B be less than 1 simply defines nothing more than that an additional layer is present or even simply that the carcass ply has a skim coat of rubber (as customary) - such is clearly taught by Koch et al. '515. Similarly requiring that C/B be greater than or equal to 0.2 simply defines a minimum thickness for the inner liner ply. Since the main purpose of the inner liner ply, namely air/moisture permeation resistance, is well established and understood in this art, it is certainly not beyond the skill of the artisan to select a certain appropriate minimum liner thickness and the claimed value has not been shown to produce unexpected results. Similarly, the broadly claimed relative liner and tire thicknesses C/D as claimed are considered to cover almost any common and conventional configuration and would present none but the expected results.

As to claim 3, as noted in the first office action, extending the liner edge below the rim flange was taken to be conventional per se in this art and therefore prima facie obvious. Further, the liner in Koch et al. as depicted would seem to end below the rim flange as claimed. As to claim 4, as already noted, Koch et al. suggests GRS which is a styrene-butadiene rubber (i.e. SBR). As to claim 5, note that Koch suggests larger amounts of sulfur in the intermediate layer to make up for the retarding effect of the silica - note also that the amount in "Example I" (i.e. the intermediate layer) is larger than the amount in "Example II" (i.e. the butyl layer). Given the higher unsaturation of the GRS layer, it further would have been expected that higher sulfur would be present for cure of such layers.

Claim 6 differs from claim 1 in requiring carbon black in the intermediate layer. However, most (by far) rubber layers used in tire applications (other than for example

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white sidewalls) include carbon black reinforcing filler. Note further that Koch et al. '515 clearly teaches the inclusion of carbon black in the intermediate layer - note the table entitled "Example I" in the patent.

As to claim 7, although Koch et al. '515 is primarily directed to GRS (i.e. SBR) intermediate layers, the reference would seem to contemplate the use of other diene rubbers as claimed - note col. 2, lines 26-30. Further, it is submitted that the bonding problems due to the difference in the degree of saturation between the butyl layer and the more highly saturated carcass rubber would have been expected to be present for conventional unsaturated carcass rubbers other than just SBR (i.e. including NR, IR and BR, which are taken to be well known/conventional carcass rubber materials, as claimed). As such, the teaching to include an intermediate layer to help avoid the hogging of the sulfur by the carcass would have been expected to also be applicable to such other carcass rubbers."

As to the changes made to claims 1 and 6 in the 7-26-2002 amendment, as noted above, there were two substantive changes made with respect to the claims as they appeared before the Board of Appeals: first, the term "essentially" was removed from the description of the rubber component of the first rubber composition (i.e. the inner liner) and second, the second rubber composition (i.e. of the rubber bonding layer) was newly defined to include "a rubber component consisting of" a diene rubber rather than simply "including a diene rubber".

With respect to the removal of the term "essentially" from the description of the rubber component of the first rubber composition, it should first be noted that it is not entirely clear that this necessarily can be read as excluding other rubbers from the inner liner as arguably there is no clear indication or requirement that this rubber component be the only rubber component in the first rubber composition or in fact that the "first rubber composition" is the only rubber composition in the inner liner (reading "made of" as being open language). In any event, whether or not other rubber are excluded, it was considered by the examiner that the Berta references would have suggested or

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rendered obvious an inner liner composition where the only rubbers are the butyls - In particular, as set forth in the previous statement of rejection, note first that it can be argued that the chlorinated polyisoprene from example 15 of Berta '686 is not part of the rubber component of the composition but rather is simply an "additive". Further, note that Berta '686 indicates that the chlorinated polyisoprene additive is within a class of materials named "chlorinated hydrocarbons", and may be used either as chlorinated polyisoprene or chlorinated polyolefin. Berta '302 makes it even clearer that the artisan would have recognized that both chlorinated polyisoprene and chlorinated polyolefin are suitable alternatives, and it therefore would have been well within the skill of the artisan to utilize a "chlorinated polyolefin" in place of the chlorinated polyisoprene in a composition consistent with ex. 15 in Berta '686. In such case, it seems that the sole rubber material present would be the two butyl rubbers. As such, providing a composition for the inner liner that only includes the regular and halobutyl was considered to have been taught/obvious.

With respect to newly defining the second rubber composition (i.e. of the rubber bonding layer) to include "a rubber component consisting of a diene rubber" rather than simply "including a diene rubber", this does not affect this rejection as Koch et al. only uses a diene rubber in the bonding layer. Further, and in any event, it is again not considered that this language excludes the presence of other rubber components consisting of other rubbers, i.e. since the term "including" is an open term (akin to "comprising"), defining that the composition "includes a rubber component consisting of

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a diene rubber” does not exclude the inclusion of other rubber components consisting of other rubbers.

Again, although applicant additionally argues that the claim 6 language excludes the presence of silica in the second rubber composition, the relevant language is unchanged from that before the Board of Appeals and the Board of Appeals has already unambiguously determined that silica is not excluded (e.g. page 14 of the decision by the Board of Appeals).

5. Applicant's arguments filed 7-26-2002 have been fully considered but they are not persuasive.

Applicant's arguments, and particularly those with respect to the amended language in claims 1 and 6, have been treated above within the statement of rejection.

Applicant also argues that the teachings of Koch and Exxon with respect to the accelerator systems are only with respect to butyl rubbers or innerliners and do not provide any teachings about curing systems for a diene rubber intermediate layer. This argument has been considered but the Board of Appeals has stated (on page 11) that “we conclude that, *prima facie*, the combined teachings of the references would have reasonably suggested to one of ordinary skill in this art that a sulfenamide accelerator can be used alone or with other accelerators in the compounding composition of Koch Example I with the expectation of obtaining a compounding composition for an intermediate rubber layer with the adhesion properties taught by the references.” Applicant's arguments have thus been refuted by the findings/conclusions of the Board of Appeals.

The 7-26-2002 37 CFR 1.132 declaration of Taguchi ("Taguchi III") has also been fully considered but is unpersuasive of the non-obviousness of the present invention. In particular, this declaration compares properties (esp. crack growth resistance) for the inventive compositions as compared to the Example II liner material of Koch et al. Improvement in both unaged and aged crack growth resistance however would seem to have been a fully expected result when providing a liner composition by blending regular butyl with a halo-butyl rubber - note again the Exxon technical article. In particular, again, pages 53-54 (including the table) of the cited Exxon technical article indicate that halobutyl can be blended with regular butyl at amounts of up to 30% to provide a "significant increase in flex resistance" and also a small benefit in retained elongation after heat aging while leaving permeability, tack and processing characteristics unchanged (note further that this would have been read to clearly contemplate applications as an innerliner material as mention is made of adhesion to a "tyre carcass compound"). A halobutyl/regular butyl blend as taught by the Exxon article would thus have been expected to display improved flex resistance, etc. in the resultant compound. It should again be stressed that the expectation of improved flex resistance is considered to have provided an expectation of improved crack growth resistance, it being considered that damage from excessive flex would be expected to manifest itself in a rubber composition as a crack in the material. Note that both "flex resistance" as set forth in the Exxon technical article (note esp. Table 1 on page 54), and cut growth resistance as defined in the present specification, are measured by subjecting the material to repeated fatigue or flexing. The artisan would thus have been

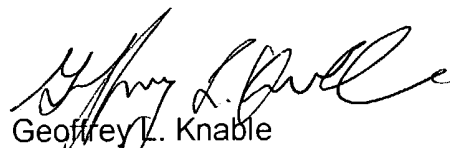
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strongly motivated to utilize such blends. The Taguchi III declaration, then, when balanced against the teachings of the prior art, and particularly the fact that these results would not appear to in fact be unexpected, is not considered to render the claimed invention non-obvious. Note also the discussion of results presented by the Board of Appeals.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey L. Knable whose telephone number is 571-272-1220. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Primary Examiner  
Art Unit 1733

G. Knable  
March 21, 2004